

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A trackball for inputting operation information to electronic devices, said trackball comprising:

a ball portion magnetically coupleable in directions of a first axis and a second axis, the first and second axes intersecting with each other at the center of ~~the~~ said ball portion and being orthogonal to each other;

a case portion for enclosing ~~the~~ said ball portion such that an upper portion of ~~the~~ said ball portion is exposed;

a first magnet portion for stabilizing ~~the~~ said ball portion at predetermined rotation angles by magnetically coupling to ~~the~~ said ball portion in one of the axial directions; and

a second magnet portion for attracting ~~the~~ said ball portion in a direction orthogonal to a rotation axis of ~~the~~ said ball portion, by magnetically coupling to ~~the~~ said ball portion in the other one of the axial directions.

2. (Currently amended) The trackball according to claim 1, wherein:

~~the~~ said ball portion is magnetically coupleable in a direction of a third axis intersecting with the first and second axes at the center of ~~the~~ said ball portion and orthogonal to the first and second axes; and

~~the~~ said first magnet portion allows each of any two axes among the first to third axes which are present on the same plane to serve as a rotation axis of ~~the~~ said ball portion.

3. (Currently amended) The trackball according to claim 2, wherein ~~the~~ said ball portion comprises first to third bar members arranged on the first to third axes, respectively, and made of an unmagnetized magnetic material, wherein:

~~the~~ said first magnet portion comprises:

a first fixed magnet portion made up of a pair of first magnets for forming a first rotation axis by magnetically coupling to ~~the~~ said first bar member, ~~the~~ said first magnets being respectively fixed to side-surfaces of ~~the~~ said case portion;

and

a second fixed magnet portion made up of a pair of second magnets for forming a second rotation axis by magnetically coupling to ~~the second~~ said third bar member, ~~the said third~~ magnets being respectively fixed to side-surfaces of ~~the said~~ case portion; and

~~the said~~ second magnet portion comprises a third fixed magnet portion for attracting ~~the third~~ said second bar member by magnetically coupling to ~~the third~~ said second bar member, ~~the said third~~ fixed magnet portion being fixed to a bottom-surface of ~~the said~~ case portion;

said first and second fixed magnet portions each have a common pole directed toward a center of said ball portion; and

said third fixed magnet portion has a pole opposite to that of said first and second fixed magnet portions directed toward the center of said ball portion.

4. (Currently amended) The trackball according to claim 3, wherein ~~the said~~ ball portion further comprises an even number of bar members arranged on an even number of axes, respectively, and made of an unmagnetized magnetic material, the even number of axes intersecting at an intersection point of any two axes among the first to third axes which are present on the same plane, and at equal angles.

5. (Currently amended) The trackball according to claim 3, wherein ~~the said~~ case portion is made of an unmagnetized magnetic material.

6. (Currently amended) The trackball according to claim 2, further comprising a third magnet portion arranged at a location that makes a predetermined angle from any one of rotation axes formed by ~~the said~~ first magnet portion, ~~and stabilizing said third magnet portion being operable to stabilize said~~ the ball portion by magnetic coupling when the said ball portion rotates around the any one of rotation axes.

7. (Currently amended) The trackball according to claim 6, further ~~comprises~~ comprises magnetic force switching means for switching between a presence and absence of a magnetic force of the said third magnet portion.

8. (Currently amended) The trackball according to claim 7, wherein ~~the said~~ magnetic force switching means ~~performs~~ is for performing the switching in accordance with control parameters of the electronic devices.

9. (Currently amended) The trackball according to claim 1, wherein the magnetic force of ~~the said~~ second magnet portion is greater than that of each magnet in said ~~the~~ first magnet portion.

10. (Currently amended) The trackball according to claim 9, wherein the magnetic force of ~~the said~~ second magnet portion is twice that of each magnet in said ~~the~~ first magnet portion.

11. (Currently amended) The trackball according to claim 1, wherein:
 ~~the said~~ ball portion is magnetically coupleable in directions of a plurality of axes on a plane made up of the first and second axes, the plurality of axes intersecting at an intersection point of the first and second axes; and
 ~~the said~~ case portion ~~exposes~~ is operable to expose the upper portion of ~~the said~~ ball portion so as to restrict a rotation angle of ~~the said~~ ball portion.

12. (Currently amended) The trackball according to claim 11, wherein:
 the plurality of axes are even in ~~an even~~ number;
 ~~the said~~ ball portion comprises:
 first and second bar members arranged on the first and second axes, respectively, and made of an unmagnetized magnetic material; and
 an even number of a plurality of bar members arranged on the plurality of axes, respectively, and made of an unmagnetized magnetic material;
 ~~the said~~ first bar member, ~~the said~~ second bar member, and ~~the said~~ plurality of bar members are arranged with an equal angle therebetween; and

~~the said~~ case portion ~~exposes~~ is operable to expose the upper portion of ~~the said~~ ball portion such that ~~the said~~ ball portion rotates at an angle corresponding to an angle between ~~the said~~ bar members.

13. (Currently amended) An in-vehicle device controller comprising a trackball for inputting operation information to electronic devices mounted on a vehicle, wherein the said trackball comprises:

a ball portion magnetically coupleable in directions of a first axis and a second axis, the first and second axes intersecting with each other at the center of ~~the said~~ ball portion and being orthogonal to each other;

a case portion for enclosing ~~the said~~ ball portion such that an upper portion of ~~the said~~ ball portion is exposed;

a first magnet portion for stabilizing ~~the said~~ ball portion at predetermined rotation angles by magnetically coupling to ~~the said~~ ball portion in one of the axial directions; and

a second magnet portion for attracting ~~the said~~ ball portion in a direction orthogonal to a rotation axis of ~~the said~~ ball portion, by magnetically coupling to ~~the said~~ ball portion in the other one of the axial directions.

14. (Currently amended) The in-vehicle device controller according to claim 13, wherein ~~the said~~ trackball is mounted on a steering-wheel portion of the vehicle.